PCB.xchange Data Translator

For modeling PC boards in NX and exchanging data with ECAD PCB design systems

fact sheet

▶ **Summary**

The PCB.xchange translator provides bi-directional data exchange between ECAD printed circuit board (PCB) layout software and NX digital product development applications. It works with the majority of ECAD PCB layout software products and can be used to directly generate NX 3D assembly models of the PC board and components. PCB.xchange is an invaluable tool for integrating the mechanical and electrical design processes.

Features

Integrates mechanical and electrical design processes

Provides bi-directional sharing of PCB designs between ECAD systems and NX

Provides for the preview of IDF files and visualization of data exchange process

Provides rules-based filtering of components and features

Allows user to generate web HTML reports of PCB assembly

Tracks and manages changes with Compare and Update feature

Benefits

Promotes design collaboration through sharing of engineering information

Helps eliminate errors

Shortens design time; improves overall efficiency

Eliminates tedious work for mechanical designers

PCB.xchange allows for the modeling of a PC board within the NX digital product development system. The resulting data can then be exchanged, using the IDF file format standard, with ECAD PCB design systems. Once an NX assembly has been created, it is accessible by all NX applications for design review, assembly and tolerance analysis.

The PCB design process can also be initiated in NX using the PCB.modeler application. A user can then export the PCB outline and key component locations, as well as holes and restriction areas to an ECAD PCB layout package. Because this translator directly uses existing PCB layout data, the task of interpreting and re-entering information is eliminated. The result is fewer errors, faster turnaround time and elimination of tedious work for mechanical designers.

Within NX a mechanical designer can define board shape, specify important keep-in and keep-out areas, and pre-place critical components such as connectors, switches, displays and LEDs using the assembly design capabilities within NX and PCB.modeler. The preliminary PCB design can then be transferred to an ECAD system for the PCB designer to use as the basis for the board design. After placing the remaining components in the ECAD system, the fully placed board assembly can be passed back to NX. The mechanical designer can ensure the board assembly fits into the final product package. Multiple iterations of this basic design data flow between ECAD and MCAD systems typically occur during the product design phase. PCB.xchange makes it easy to transfer complex PCB assembly data between NX and ECAD packages.

In addition, the PCB design in NX can be used to generate manufacturing and product documentation. The PCB assembly can also be used to perform detailed thermal and structural analysis of the board using NX MasterFEM – a full function simulation environment.

PCB.xchange facilitates the following engineering tasks:
• Online design reviews to verify manufacturability
• Tolerance analysis

NX
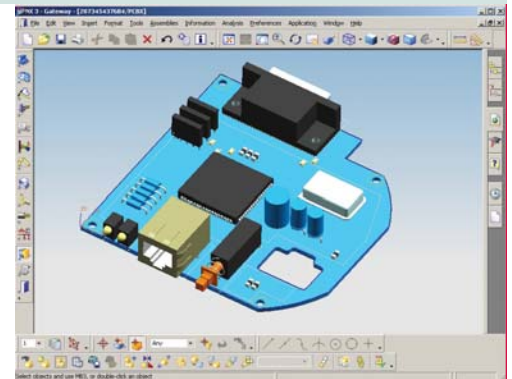
ECAD requirements

PCB.xchange uses the IDF2, IDF3 and IDF4 standard file format for data exchange. Most ECAD vendors support IDF2 or IDF3 for data exchange. Both PCB.xchange and an ECAD IDF translator are required to complete the bi-directional transfer of PCB data between systems. ECAD PCB layout systems that support IDF include Mentor Graphics, Cadence, Zuken-Redac, OrCAD, PADS, Accel-PCAD and Incases.

Prerequisites

NX modeling and assembly design

PCB IDF translator from ECAD vendor

- Sheet metal part design and flat pattern development
- Board and system-level structural and thermal analysis
- Vibration and impact analysis
- Numerical control toolpath creation
- Plastic part and mold analysis
- Drafting and technical documentation

Modeling PC boards in NX

PCB.modeler and NX assembly design applications make it easy to model PCB assemblies. Boards and components are modeled using standard part modeling practices with NX. An assembly of the board and components is created within the NX application, and the PCB.modeler helps identify additional board and component information for exchange with the ECAD system. PCB.modeler provides the tools to identify board components, drilled holes, restriction (keep-in and keep-out) areas; and, it checks your PCB assembly and generates HTML web reports.
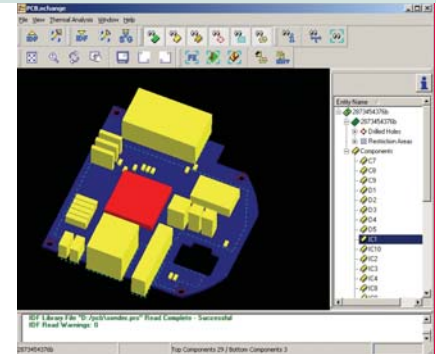
Component libraries. An essential part of the PCB data exchange process is coordinating component part information between NX and the ECAD system. PCB.xchange provides simple methods to help match and filter component data between NX and the ECAD system.

- *Component mapping* – allows for maintenance of different component part names and numbers between the two systems.
- *Filtering* – allows for the removal of small components or small board features, such as pinholes, for more efficient assembly modeling.

PCB.xchange allows a user to interactively preview IDF files and visualize the data exchange process. When IDF files are imported from ECAD, PCB.xchange will automatically create extruded component footprints to create 3D parts and correctly position instances of these parts on the board assembly. It can also use detailed components available in Teamcenter part folders to create PCB assemblies. Teamcenter is a software solution family from UGS that enables enterprises to capture, manage, access, integrate and leverage diverse types of product information in a web-native environment.

Data exchange capabilities

PCB.xchange allows for the bi-directional sharing of PCB design data between the ECAD system and NX, including:

- Board layout with cut-outs and thickness
- Component footprint, height and layout including board side and offsets
- Drilled holes and hole properties
- Restriction areas (keep-ins and keep-outs)
- Component reference designators
- Component or package name/number
- Rules-based filtering of component and board features
- Web (HTML) based reports of IDF contents and the PCB assembly

PCB.xchange also supports the following:

- Automatically substitutes NX parts for the board assembly
- Compares NX and IDF models
- Allows for selective updating of NX models
- Imports and exports previewing of data exchange

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